

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A process for producing a light absorbing layer for a chalcopyrite type thin-film solar cell, comprising the steps of:

 a precursor forming step of superimposing on a backside electrode layer formed on a substrate, an In metal layer adjacent to the electrode layer and a Cu-Ga alloy layer by sputtering;

 a first selenization step of accommodating the precursor-formed substrate in an airtight space and introducing hydrogen selenide gas into the airtight space conditioned to a temperature in a range from room temperature to 250°C;

 a second selenization step of heating an interior of the airtight space to a temperature in a range from 250° to 450°C and, additionally introducing hydrogen selenide gas into the airtight space, interrupting the supply of hydrogen selenide gas and evacuating the interior of the airtight space followed by reintroducing hydrogen selenide gas into the airtight space for 10 minutes to 120 minutes to introduce selenium into the precursor and diffuses In, Cu, and Ga in the precursor;

 a third selenization step of heating an interior of the airtight space to a temperature in a range from 450° to 650°C, and performing heat treatment of the substrate under the above temperature conditions using the hydrogen selenide gas reintroduced at the second selenization step for 10 minutes to 120 minutes to recrystallize the precursor to form the light absorbing layer, while causing the hydrogen selenide gas introduced up to the second selenization step to remain in the space; and

 a cooling step of cooling the substrate after the heat treatment.

2. (Canceled).

3. (Withdrawn) The process for producing the light absorbing layer for the chalcopyrite type thin-film solar cell according to claim 1, wherein hydrogen selenide gas is continuously supplied immediately after the first selenization step and in the second selenization step.

4. (Previously Presented) The process for producing the light absorbing layer for the chalcopyrite type thin-film solar cell according to claim 1, wherein the substrate is accommodated almost in an upright position in a cabinet rotatably disposed in the airtight space and the cabinet is rotated in at least one of the first, second, third selenization steps and the cooling step.

5. (Canceled)

6. (Withdrawn) The process for producing the light absorbing layer for the chalcopyrite type thin-film solar cell according to claim 3, wherein the substrate is accommodated almost in an upright position in a cabinet rotatably disposed in the airtight space and the cabinet is rotated in at least one of the first, second, third selenization steps and the cooling step.

7. (Canceled)

8. (New) The process for producing the light absorbing layer for the chalcopyrite type thin-film solar cell according to claim 1, wherein the precursor forming step does not comprise forming a selenium layer on the backside electrode layer of the substrate before heating the substrate.

9. (New) A process for producing a light absorbing layer for a chalcopyrite type thin-film solar cell, comprising:

forming a precursor of an In metal layer and a Cu-Ga alloy layer on a backside electrode layer of a substrate;

preheating the precursor-formed substrate in an airtight space at a temperature less than 250°C and introducing a hydrogen selenide gas into the airtight space;

heating an interior of the airtight space to a temperature in a range from 250° to 450°C and additionally introducing hydrogen selenide gas into the airtight space for 10 minutes to 120 minutes to introduce selenium into the precursor and diffuses In, Cu, and Ga in the precursor; and

heating the interior of the airtight space to a temperature in a range from 450° to 650°C and performing heat treatment of the substrate under the above temperature conditions for 10 minutes to 120 minutes to recrystallize the precursor to form the light absorbing layer.

10. (New) The process for producing the light absorbing layer for the chalcopyrite type thin-film solar cell according to claim 1, wherein the process does not comprise forming a precursor that comprise a selenium layer on the backside electrode layer of the substrate before heating the substrate.